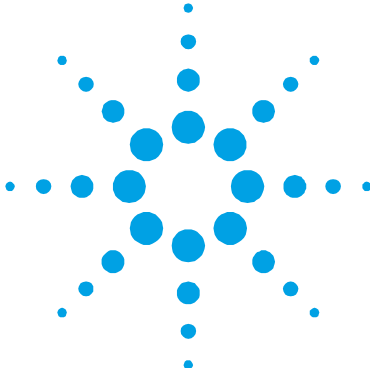

Dual Profibus Gateway

Model
929-7016

Manuale di Istruzioni
Bedienungshandbuch
Notice de Mode D'Emploi
User Manual

87-900-113-01 (C)
05/2011

Agilent Technologies

Notices

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CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Dual Profibus Gateway

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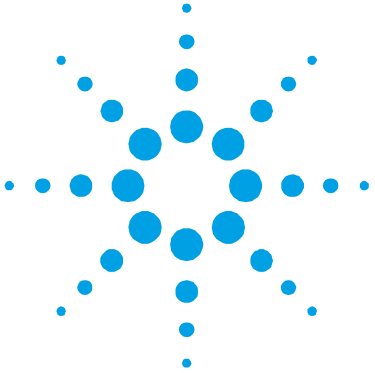

1 Procedura per l'installazione

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Traduzione delle istruzioni originali

Informazioni Generali

Questa apparecchiatura è destinata ad uso professionale. L'utilizzatore deve leggere attentamente il presente manuale di istruzioni ed ogni altra informazione addizionale fornita dalla Agilent prima dell'utilizzo dell'apparecchiatura. La Agilent si ritiene sollevata da eventuali responsabilità dovute all'inosservanza totale o parziale delle istruzioni, ad uso improprio da parte di personale non addestrato, ad interventi non autorizzati o ad uso contrario alle normative nazionali specifiche.

Nei paragrafi seguenti sono riportate tutte le informazioni necessarie a garantire la sicurezza dell'operatore durante l'utilizzo dell'apparecchiatura. Informazioni dettagliate sono fornite nell'appendice "Technical Information".

Questo manuale utilizza le seguenti convenzioni:

AVVERTENZA!

I messaggi di avvertenza attirano attirano l'attenzione dell'operatore su una procedura o una pratica specifica che, se non eseguita in modo corretto, potrebbe provocare gravi lesioni personali.

ATTENZIONE! I messaggi di attenzione sono visualizzati prima di procedure che, se non osservate, potrebbero causare danni all'apparecchiatura.

NOTA Le note contengono informazioni importanti estrapolate dal testo.

Immagazzinamento

Durante il trasporto e l'immagazzinamento del Profibus Gateway non devono essere superate le seguenti condizioni ambientali:

- temperatura: da 0 °C a +70 °C
- umidità relativa: 0 – 95 % (non condensante)

Preparazione per l'installazione

Il Profibus Gateway viene fornito in un imballo protettivo speciale; se si presentano segni di danni, che potrebbero essersi verificati durante il trasporto, contattare l'ufficio vendite locale. Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente.

Installazione

Non installare e/o utilizzare il Profibus Gateway in ambienti esposti ad agenti atmosferici (pioggia, gelo, neve), polveri, gas aggressivi, in ambienti esplosivi o con elevato rischio di incendio.

Durante il funzionamento è necessario che siano rispettate le seguenti condizioni ambientali:

- temperatura: da + 5 °C a +40 °C
- umidità relativa: 0 – 90 % (non condensante).

ATTENZIONE! Il Profibus Gateway appartiene alla prima categoria di installazione (o sovratensione) prevista dalla normativa EN 61010-1. Connettere quindi il dispositivo ad una linea di alimentazione che soddisfi tale categoria. Il Profibus Gateway ha dei connettori per gli ingressi/uscite e per la comunicazione seriale che devono essere connessi ai circuiti esterni in modo che nessuna parte sotto tensione sia accessibile. Assicurarsi che l'isolamento del dispositivo connesso al Profibus Gateway abbia un isolamento adeguato anche in condizione di guasto singolo come previsto dalla normativa EN 61010-1.

Per l'installazione degli accessori opzionali, vedere "Technical Information".

Uso

In questo paragrafo sono riportate le principali procedure operative.

Prima di usare il controller effettuare tutti i collegamenti elettrici.

Accensione ed Uso del Profibus Gateway

Per accendere il Profibus Gateway è sufficiente fornire la tensione di alimentazione.

Il LED rosso sul pannello frontale del Gateway indica che il dispositivo è alimentato. Il LED verde, invece, indica lo stato del dispositivo:

- Lampeggio lento: scambio dati
- 1 impulso: errore link RS 485 (ad esempio, il dispositivo è ancora in fase di ricerca controller)
- 2 impulsi: errore link Profibus (ad esempio, il dispositivo non è indirizzato dal master)
- Lampeggio veloce: errore interno.

Arresto del Profibus Gateway

Per arrestare il Profibus Gateway è sufficiente togliere la tensione di alimentazione.

Manutenzione

Il Profibus Gateway non richiede alcuna manutenzione. Qualsiasi intervento deve essere eseguito da personale autorizzato.

Prima di effettuare qualsiasi intervento sul sistema scollegarlo dall'alimentazione.

NOTA Prima di rispedire al costruttore il Profibus Gateway per riparazioni o advanced exchange service, è indispensabile compilare e far pervenire al locale ufficio vendite la scheda "Sicurezza e Salute" allegata al presente manuale di istruzioni. Copia della stessa deve essere inserita nell'imballo del sistema prima della spedizione.

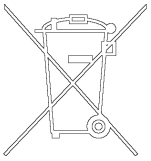
Qualora il Profibus Gateway dovesse essere rottamato, procedere alla sua eliminazione nel rispetto delle normative nazionali specifiche.

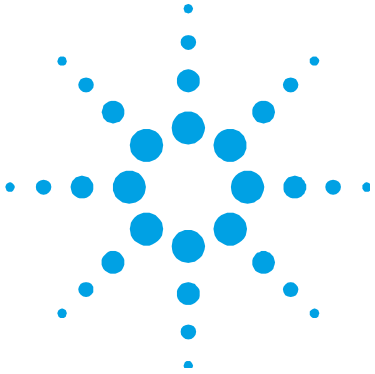
Smaltimento

Significato del logo "WEEE" presente sulle etichette.

Il simbolo qui sotto riportato è applicato in ottemperanza alla direttiva CE denominata "WEEE".

Questo simbolo **(valido solo per i paesi della Comunità Europea)** indica che il prodotto sul quale è applicato, NON deve essere smaltito insieme ai comuni rifiuti domestici o industriali, ma deve essere avviato ad un sistema di raccolta differenziata. Si invita pertanto l'utente finale a contattare il fornitore del dispositivo, sia esso la casa madre o un rivenditore, per avviare il processo di raccolta e smaltimento, dopo opportuna verifica dei termini e condizioni contrattuali di vendita.





2 Anleitung zur Installation

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Übersetzung der Originalanleitungen

Allgemeine Informationen

Diese Vorrichtung ist für eine professionelle Anwendung bestimmt. Der Benutzer muss, vor Anwendung, vorliegendes Handbuch und alle weitere von Agilent gelieferte Angaben, aufmerksam durchlesen. Agilent ist für etwaige auf teilweise oder gesamte Nichtberücksichtigung der Gebrauchsanweisungen beruhende Verantwortungen, für eine nicht geeignete Anwendung durch nicht ausgebildetes Personal, für nicht autorisierte Eingriffe oder für Anwendung unter Nichtbeachtung der nationalen Bestimmungen, nicht verantwortlich. In den folgenden Absätzen sind alle notwendigen Informationen über die Sicherheit des Bedienungspersonals, während des Betriebs, angegeben. Ausführliche Angaben sind im Anhang "Technical Information", enthalten.

Dieses Handbuch benutzt folgende konventionelle Angaben.

WARNUNG!

Die Warnhinweise deuten auf ein Verfahren oder ein besonderes Verhalten hin, das bei Nichtbeachtung der Vorsichtsmassnahmen, schwere persönliche Schäden verursachen könnte.

VORSICHT! Die Vorsichtshinweise erscheinen vor Verfahren, die bei Nichtbeachten, Geräteschaden verursachen könnten.

HINWEIS Die Hinweise enthalten wichtige Informationen aus dem Text.

Lagerung

Während des Transportes und der Lagerung des Profibus Gateway, dürfen folgende Umgebungsbedingungen nicht überschritten werden:

- Temperatur: von 0 °C bis +70 °C
- relative Luftfeuchtigkeit: 0 – 95 % (ohne Kondensbildung)

Vorbereitung für die Installation

Der Profibus Gateway wird in einer speziellen Schutzverpackung geliefert; sollten während des Transports Schäden aufgetreten sein, verständigen Sie bitte die lokale Verkaufsabteilung. Die Verpackung ordnungsgemäß entsorgen Das Material ist vollständig recyclebar

Installation

Den Profibus Gateway nicht in Räumen, die Regen, Frost, Schnee, Staub oder aggressivem Gas ausgesetzt sind oder in Räumen mit Explosions- oder hoher Brandgefahr, verwenden.

Während der Betätigung müssen folgende Umgebungsbedingungen berücksichtigt werden:

- Temperatur: von 5 °C bis +40 °C
- relative Luftfeuchtigkeit: 0 – 90 % (ohne Kondensbildung)

VORSICHT! Der Profibus Gateway wird in die erste Installationskategorie (Überspannung) der Norm EN 61010-1 eingestuft. Die Vorrichtung muss an eine Netzlinie angeschlossen werden, die dieser Kategorie entspricht. Profibus Gateway verfügt außer den, für die serielle Kommunikation vorgesehenen Stecker, auch Ausgangs- und Eingangsstecker, die mit den äußeren Schaltungen verbunden werden müssen, sodass kein Teil unter Spannung zugänglich sein kann. Sicherstellen, dass die Isolierung der mit dem Profibus Gateway verbundenen Vorrichtung, auch im Einzelschadenfall, so wie von Norm EN 61010-1 vorgesehen, eine angebrachte Isolierung besitzt.

Für die Installation der Options-Nebeneinrichtungen, beachten Sie bitte den Abschnitt "Technical Information".

Anwendung

In diesem Absatz werden die wichtigsten Funktionsverfahren angegeben .

Vor Anwendung des Kontrollers, alle elektrische Anschlüsse verbinden.

Anschalten und Betrieb des Profibus Gateway

Zum Einschalten des Profibus Gateway braucht dieser nur mit Spannung versorgt zu werden.

Die rote LED auf der Vorderseite des Gateway zeigt an, ob das Gerät versorgt ist. Die grüne LED zeigt hingegen den Status an:

- langsames Blinken: Datenaustausch
- 1 Impuls: RS 485 Verbindungsfehler (z.B. das Gerät sucht noch die Steuereinheit)
- 2 Impulse Profibus Verbindungsfehler (z.B. das Gerät wird nicht vom Master adressiert)
- schnelles Blinken: interner Fehler.

Abschalten des Profibus Gateway

Um den Profibus Gateway abzuschalten, genügt es die elektrische Versorgung abzuschalten.

Wartung

Für den Profibus Gateway ist keine Wartung erforderlich. Jeder Eingriff unterliegt autorisiertem Personal.

Vor jedem Eingriff, die elektrische Versorgung unterbrechen.

HINWEIS Vor Rücksendung des Profibus Gateway zum Hersteller zu Reparatur oder Advanced Exchange Service muss das Formular "Sicherheit und Gesundheit, das diesem Handbuch beigelegt ist, ausgefüllt und an das lokale Verkaufsbüro gesendet werden. Eine Kopie davon muss der Systemverpackung beigefügt werden.

Im Falle einer Verschrottung des Profibus Gateway, muss diese nach den nationalen Vorschriften erfolgen.

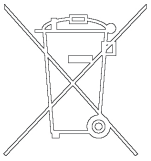
Entsorgung

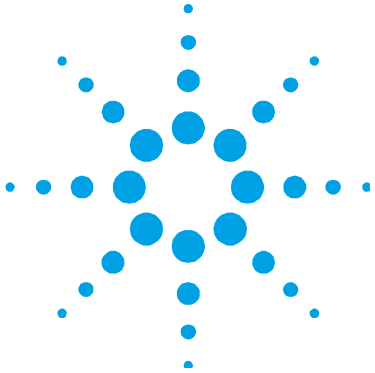
Bedeutung des "WEEE" Logos auf den Etiketten.

Das folgende Symbol ist in Übereinstimmung mit der EU-Richtlinie WEEE (Waste Electrical and Electronic Equipment) angebracht.

Dieses Symbol (**nur in den EU-Ländern gültig**) zeigt an, dass das betreffende Produkt nicht zusammen mit Haushaltsmüll entsorgt werden darf sondern einem speziellen Sammelsystem zugeführt werden muss.

Der Endabnehmer sollte daher den Lieferanten des Geräts - d.h. die Muttergesellschaft oder den Wiederverkäufer - kontaktieren, um den Entsorgungsprozess zu starten, nachdem er die Verkaufsbedingungen geprüft hat.





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Traduction de la mode d’emploi originale

Indications Generales

Cet appareillage a été conçu en vue d'une utilisation professionnelle. Avant toute utilisation de l'appareil, il est conseillé à l'utilisateur de lire attentivement cette notice d'instructions ainsi que toute autre indication supplémentaire fournie par Agilent qui décline par conséquent toute responsabilité en cas de non respect total ou partiel des instructions données, d'utilisation impropre par un personnel non formé, d'opérations non autorisées ou d'emploi contraire aux réglementations nationales spécifiques.

Les paragraphes suivants fournissent toutes les indications nécessaires à garantir la sécurité de l'opérateur pendant l'utilisation de l'appareillage. Des renseignements plus détaillés se trouvent dans l'appendice "Technical Information".

Cette notice utilise les signes conventionnels suivants:

AVERTISSEMENT!

Les messages d'avertissement attirent l'attention de l'opérateur sur une procédure ou une manoeuvre spéciale qui, effectuée de façon impropre, risque de provoquer de graves lésions

---

ATTENTION! Les messages d'attention apparaissent avant certaines procédures dont le non respect pourrait endommager sérieusement l'appareillage.

NOTE Les notes contiennent des renseignements importants, extrapolés du texte.

Stockage

Pendant le transport et le stockage du Profibus Gateway, veiller au respect des conditions environnementales suivantes:

- température: de 0 °C - à + 70 °C
- humidité relative: 0 - 95 % (non condensante)

Preparation pour l'installation

Le Profibus Gateway est livré dans un emballage de protection spécial; en cas d'endommagement de l'emballage pouvant s'être produit pendant le transport, contacter le bureau de vente local.

Ne pas abandonner l'emballage dans la nature. Le matériel est entièrement recyclable et conforme à la directive CEE 85/399 en matière de protection de l'environnement.

Installation

Ne pas installer et/ou utiliser le Profibus Gateway dans des milieux exposés aux agents atmosphériques (pluie, froid, neige), polveri, gaz agressifs, dans des milieux explosifs ou avec risque élevé d'incendie.

Pendant le fonctionnement, il est nécessaire de respecter les conditions environnementales suivantes:

- pression maxi: 2 bar au-delà de la pression atmosphérique
- température: de +5 °C° à +40 °C
- humidité relative: 0 – 90 % (non condensante)

ATTENTION! Le Profibus Gateway appartient à la première catégorie d'installations (ou surtension) prévue par la norme EN 61010-1. De ce fait, brancher le dispositif à une ligne d'alimentation compatible avec cette catégorie. Le Profibus Gateway dispose de connecteurs pour les entrées/sorties et pour la communication en série qui doivent être branchés aux circuits extérieurs de façon qu'aucune partie sous tension ne soit accessible. S'assurer que l'isolation du dispositif branché au Profibus Gateway a une isolation appropriée même en condition de panne individuelle selon les termes de la norme EN 61010-1.

Pour l'installation des accessoires en option, se reporter à "Technical Information".

Utilisation

Ce paragraphe présente les principales procédures opérationnelles. Avant d'utiliser le système, effectuer tous les branchements électriques.

Mise en marche et utilisation du Profibus Gateway

Pour allumer le Profibus Gateway il suffit de fournir la tension d'alimentation.

Le voyant rouge sur le panneau frontal du Gateway indique que le dispositif est alimenté. Le voyant vert, par contre, indique la condition du dispositif:

- Clignotement lent: échange données
- 1 impulsion: erreur lien RS 485 (par exemple, le dispositif est encore en phase de recherche contrôleur)
- 2 impulsions: erreur lien Profibus (par exemple, le dispositif n'est pas adressé par le master (maitre))
- Clignotement rapide: erreur interne.

Arrêt du Profibus Gateway

Pour arrêter le Profibus Gateway, il suffit de retirer la tension d'alimentation. Le contrôleur arrête immédiatement la pompe.

Entretien

Le Profibus Gateway n'exige aucun entretien particulier. Toute intervention doit être effectuée par un personnel agréé.

NOTE Avant de renvoyer le Profibus Gateway au constructeur pour réparation ou "advanced exchange service", remplir et faire parvenir au bureau Agilent de votre région la fiche "Sécurité et Santé" jointe au présent manuel d'instructions. Une copie de cette fiche devra être mise dans l'emballage de la pompe avant l'expédition.

En cas de mise au rebut du Profibus Gateway, procéder à son élimination conformément aux réglementations nationales concernant la gestion des déchets.

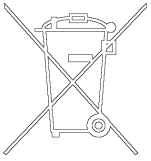
Mise au rebut

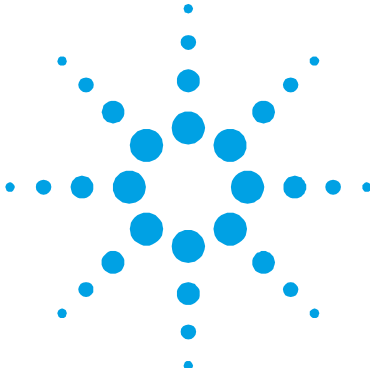
Signification du logo "WEEE" figurant sur les étiquettes.

Le symbole ci-dessous est appliqué conformément à la directive CE nommée "WEEE".

Ce symbole **(uniquement valide pour les pays de la Communauté européenne)** indique que le produit sur lequel il est appliqué NE doit PAS être mis au rebut avec les ordures ménagères ou les déchets industriels ordinaires, mais passer par un système de collecte sélective.

Après avoir vérifié les termes et conditions du contrat de vente, l'utilisateur final est donc prié de contacter le fournisseur du dispositif, maison mère ou revendeur, pour mettre en œuvre le processus de collecte et mise au rebut.





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Original Instructions

General Information

This equipment is destined for use by professionals. The user should read this instruction manual and any other additional information supplied by Agilent before operating the equipment. Agilent will not be held responsible for any events occurring due to non-compliance, even partial, with these instructions, improper use by untrained persons, non-authorized interference with the equipment or any action contrary to that provided for by specific national standards.

The following paragraphs contain all the information necessary to guarantee the safety of the operator when using the equipment. Detailed information is supplied in the appendix "Technical Information".

This manual uses the following standard protocol:

WARNING!

The warning messages are for attracting the attention of the operator to a particular procedure or practice which, if not followed correctly, could lead to serious injury.

CAUTION! The caution messages are displayed before procedures which, if not followed, could cause damage to the equipment.

NOTE The notes contain important information taken from the text.

Storage

When transporting and storing the Profibus Gateway, the following environmental requirements should not be exceeded:

- temperature: from 0° to +70 °C
- relative humidity: 0 – 95 % (non-condensing)

Preparation for Installation

The Profibus Gateway is shipped inside a special protective case; in case of damage occurred during the transport, please contact the local selling centre. Do not throw the case in the environment. The material is totally recyclable in accordance with the directive CEE 85/399 for the environmental protection.

Installation

Do not install or use the Profibus Gateway in an environment exposed to atmospheric agents (rain, snow, ice), dust, aggressive gases, or in explosive environments or those with a high fire risk.

During operation, the following environmental conditions must be respected:

- temperature: from + 5 °C to +40 °C
- relative humidity: 0 – 90 % (non-condensing)

CAUTION!

The Profibus Gateway belongs to the first installation (or overvoltage) category as per directive EN 61010-1. Connect the device to a mains line that satisfy the above category.

The Profibus Gateway has Input/Output and serial communication connectors that must be connected to external circuits in such a way that no electrical part is accessible.

Be sure that the insulation of the device connected to the Profibus Gateway is adequate even in the case of single fault as per directive EN 61010-1.

For installation of optional accessories, see "Technical Information".

Use

This paragraph details the fundamental operating procedures.

Make all electrical connections before the use of the system.

Switching on and Use of Profibus Gateway

To switch on the Profibus Gateway it is necessary to supply the mains.

The red led on the Gateway front panel indicates the device is powered.
The green led indicates the device status:

- Blink slow: data exchange
- 1 pulse: RS 485 link problem (e.g. device is still searching controller)
- 2 pulses: Profibus link problem (e.g. device not addressed from a master)
- Blink fast: internal error.

Profibus Gateway Switching off

To switch off the Profibus Gateway it is necessary to remove the mains.

Maintenance

The Profibus Gateway does not require any maintenance. Any work performed on the system must be carried out by authorized personnel.

NOTE Before returning the Profibus Gateway to the constructor for repairs, or replacement with a reconditioned unit, the "Health and Safety" sheet attached to this instruction manual must be filled-in and sent to the local sales office. A copy of the sheet must be inserted in the system package before shipping.

If a Profibus Gateway is to be scrapped, it must be disposed of in accordance with the specific national standards.

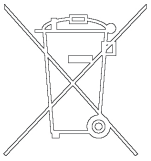
Disposal

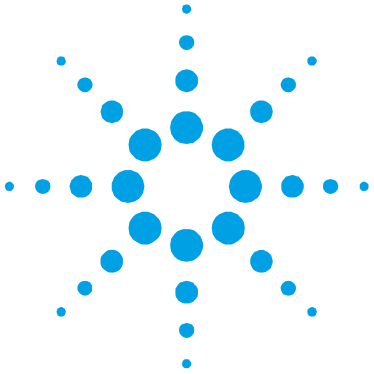
Meaning of the "WEEE" logo found in labels.

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.

This symbol **(valid only in countries of the European Community)** indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.

The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.





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Original Instructions

Introduction

The ProfiBus interface works as a bi-directional bridge between the ProfiBus network and the Agilent RS-485 link. The interface provides input data (measures) and output data (parameters) to the controller.

One to four Duals equipped with the RS-485 serial interface option can be connected to the RS-485 sub-network (contact Agilent personnel for the related Part Numbers). Each Profibus Gateway replies to a single Profibus address, set using the dial selectors on the panel. Each Dual can be controlled/read singularly by the master Profibus since each one is acknowledged as a Profibus Gateway “module”.

In addiction, the interface provides standard and user related diagnostics in order to allow the user to manage the exceptions.

This gateway is classified as DP slave device.

Mechanical

The following outline drawings show the device's dimensions and connections. To allow the rack mounting on DIN slide, an accessory bracket is provided.

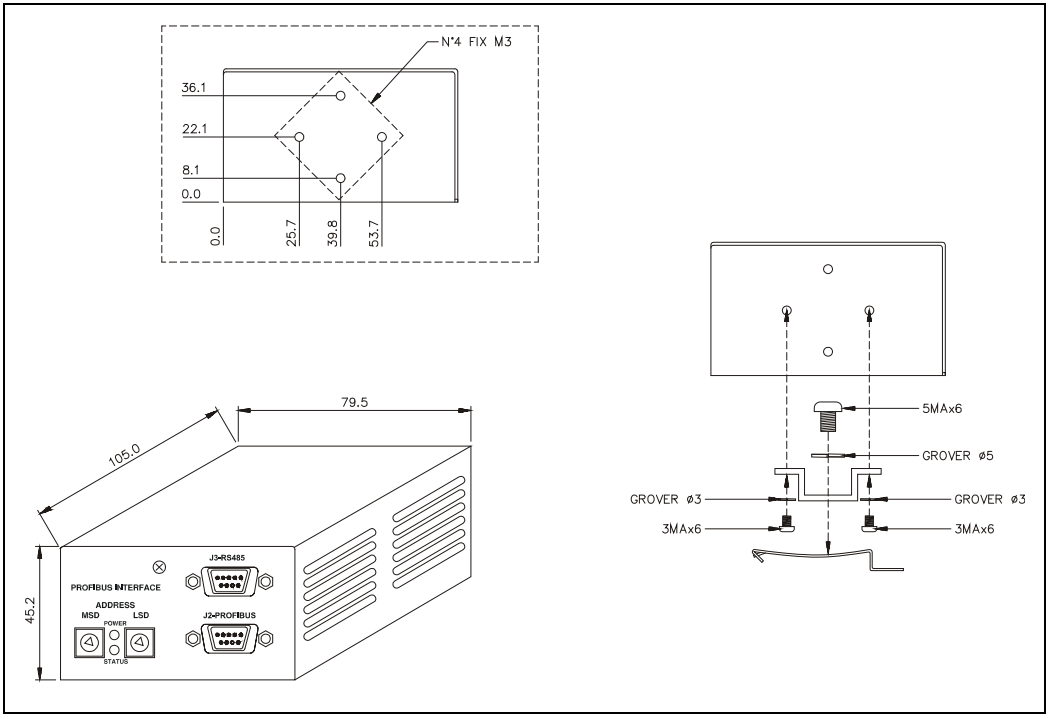

Figure 1 Outline Controller with DIN slide Assembly

Installation

This device is designed to work between a profibus network and up to 4 DUAL Agilent controller. So a typical network will appear as follow:

NOTE This unit can work only if Dual with RS-485 option is used. Please ask to Agilent Personnel to get the right part number.

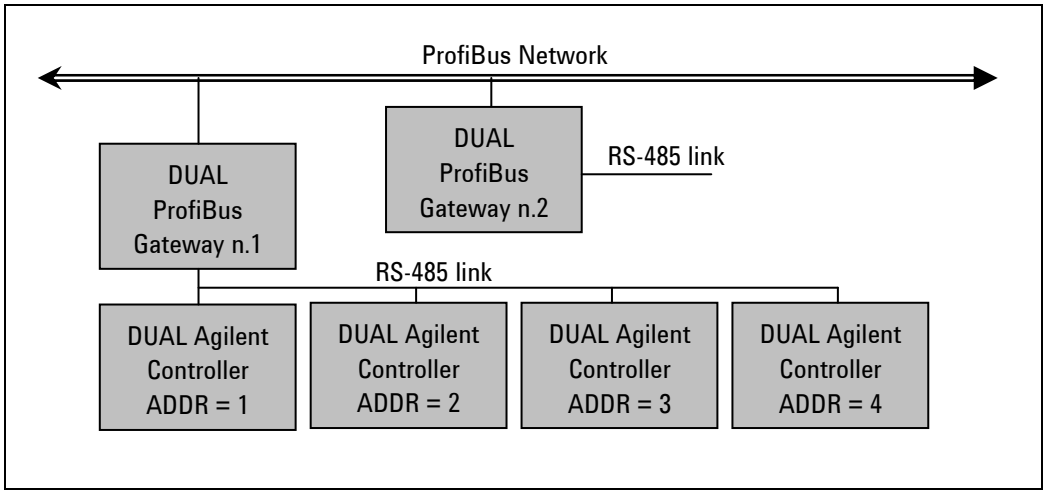
ProfiBus Network
DUAL ProfiBus Gateway n.1
DUAL ProfiBus Gateway n.2
RS-485 link
RS-485 link
DUAL Agilent Controller ADDR = 1
DUAL Agilent Controller ADDR = 2
DUAL Agilent Controller ADDR = 3
DUAL Agilent Controller ADDR = 4

Figure 2

Recommended procedure:

1. Be sure that all the units and controllers are switched off
2. For RS-485 the cabling please refer to following pin out and to the controller's manual; the RS-485 cable has to be connected in this way (note that only 3 wires are needed and not 5):
3. Connect the Profibus cable.
4. Set the address by rotational switches on the Profibus gateway.
5. To avoid some seconds time delay (up to 50 sec) after power-on due to the "controller address search phase" please follows the advice here below.
   - **a** Configure the DUAL controller to operate in RS-485 mode with a different serial address, 01-02-03-04.
   - **b** Power on the ProfiBus interface only when the controllers are ready to receive data on his serial port (internal self-test passed).
6. Ready to configure your network.

Each Dual connected to the RS-485 sub-network is acknowledged by the Profibus as an individual "module". The "Dual Profibus Gateway" must therefore be configured with a number of modules equivalent to the Duals connected to it.

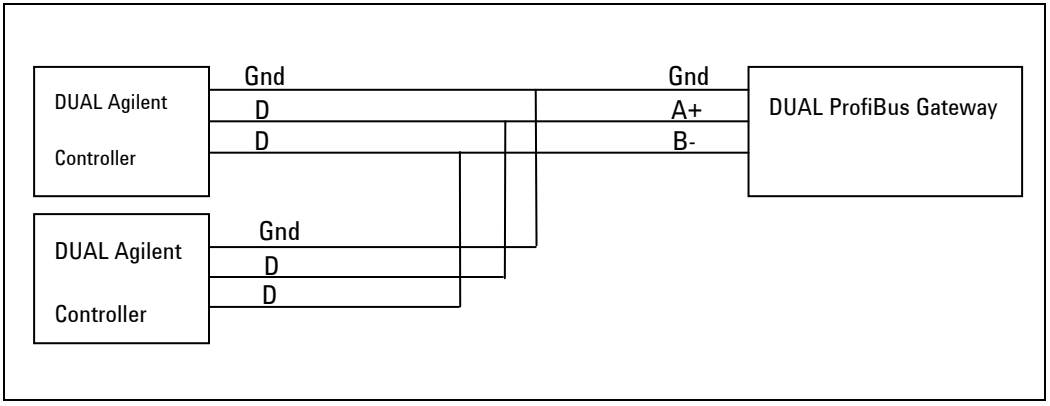

Figure 3

Connectors Pin-Out

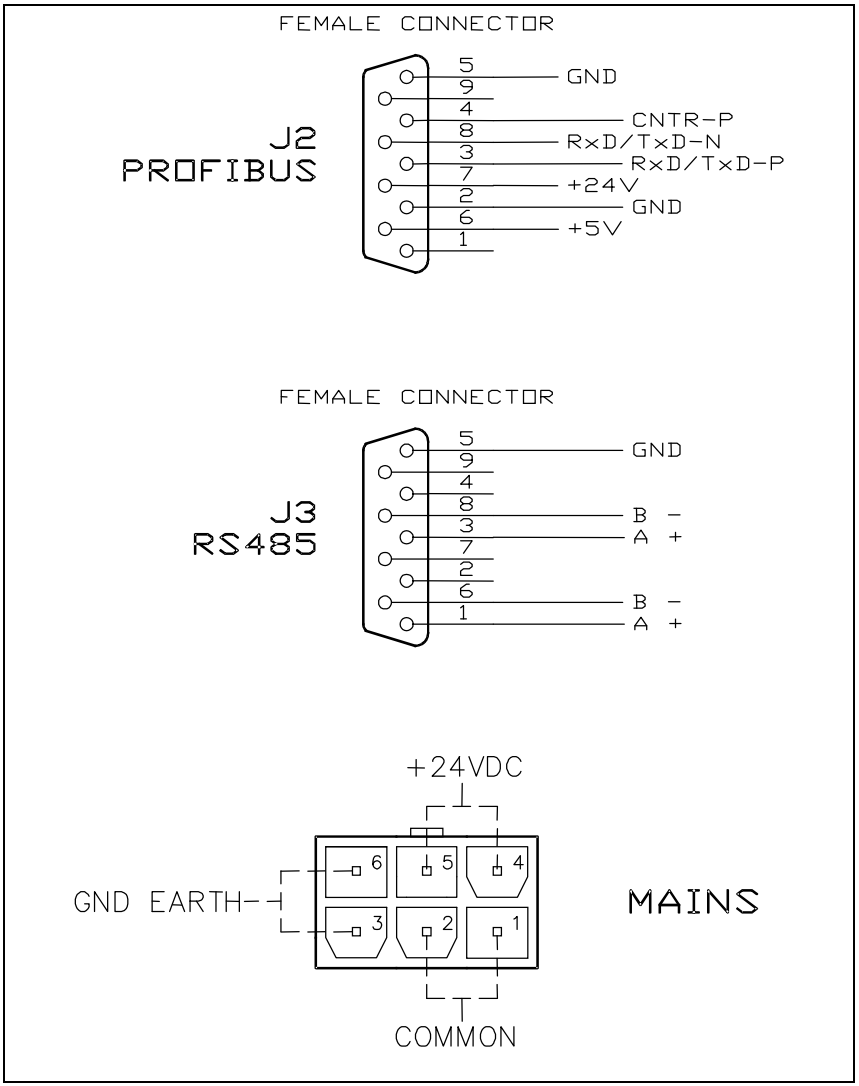

Figure 4 Dual Profibus Gateway Connectors pin-out

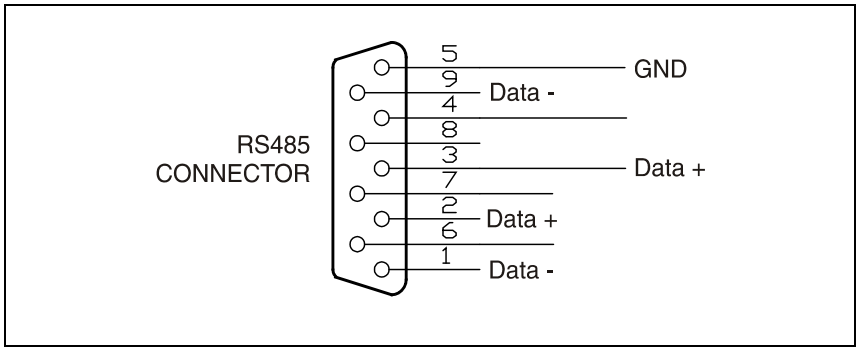

Figure 5 DUAL RS485 Connector pin-out

Rotary Switches

The interface has two switches.

The switches are used to set the ProfiBus address of the device. Up to 126 different addresses (from 0 to 125) can be selected.

The address value sets by the 2 switches is expressed in hexadecimal notation, so value from 00 to 7D are permitted; this setting is read by the interface during the power-on phase, so any change of the switch position after the power-on is ignored.

Indicators

Two LEDs are present on the interface: one green and one red.

The red led indicates that the interface is correctly powered.

The green led shows the interface status according the following table:

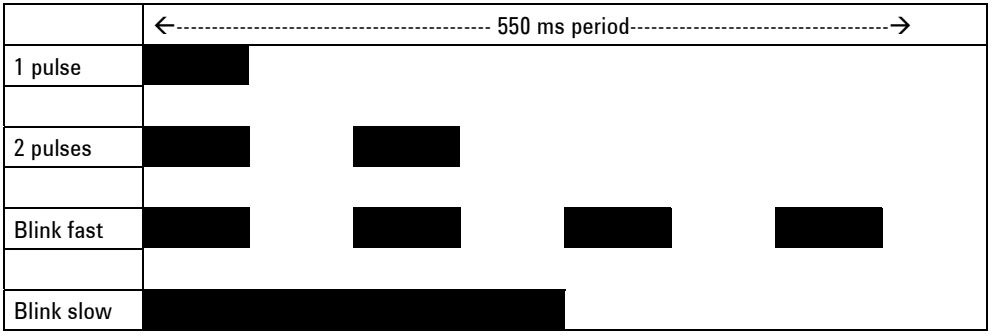

Figure 6

1 pulse

ProfiBus link established, controller link NOT established yet (Controller state machine not in Regular data exchange). This situation could be normal in the first seconds after the interface power on (Controller address searching phase) or after the controller power-on.

2 pulses

ProfiBus link not established yet (ProfiBus state machine not in Regular data exchange). This failure has priority (in the indication) over the previous.

Blink fast

Gateway fail (internal check) or wrong address set (address > 0x7D or address not stable during power-on).

Blink slow

Gateway operating properly.

GSD File

The GSD file provided with this interface is:

VAVT08D0.gsd

The ID number is:

08D0 hex

State Machine

From the software point of view, the interface can be seen as two devices (one for ProfiBus and the other for RS-485) linked together. Each device has its own state machine to manage the device operation.

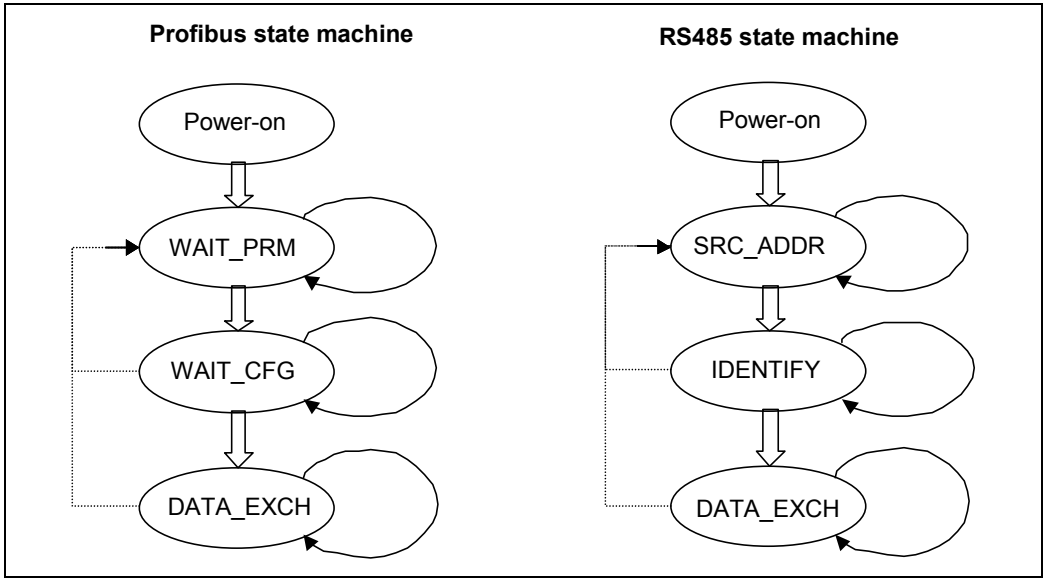

Figure 7

Tab. 1

PROFIBUS STATE MACHINE		RS485 STATE MACHINE	
Status	**Meaning**	**Status**	**Meaning**
POWER_ON	Interface set-up	POWER_ON	Interface set-up
WAIT_PRM	Wait for parameterisation from the master	SRC_ADDR	Search for the controller serial address
WAIT_CFG	Wait for configuration from the master	IDENTIFY	Identify controller model and protocol
DATA_EXCH	Regular data exchange	DATA_EXCH	Regular data exchange

The two machines continuously share I/O data with the relative bus, and interact each other only in following conditions:

- ProfiBus Data exchange is suspended (static diagnosis activated) if the RS-485 serial link in not established
- RS-485 Data exchange is suspended (only for output data) if the ProfiBus State machine is not in Data Exchange mode

As a general rule, unrecoverable communication errors make each machine to jump to the state immediately following the power-on state (WAIT_PRM or SRC_ADDR).

Message Mapping

The communication is based on the continuous data exchange capability of the ProfiBus standard, where the master sends continuously the entire slave configuration and reads back the entire slave status.

For this purpose one Input (from slave to master) and one Output (from master to slave) buffers are provided. All the needed parameters are mapped inside each buffer. The following tables reassume the ProfiBus parameter access, related to the corresponding windows serial protocol (for this protocol please refers to the controller's manual).

The interface doesn't apply any scaling operation on the read/written parameters (except the floating point format). It acts only as a gateway between the ProfiBus network and the controller's serial interface. So the user must refer to the instruction manual of the controller connected to the interface to get the correct scale of each parameter.

Configuration Buffer Structure(for each Controller Connected on the RS-485 Network)

Total buffer length: 12 bytes

Tab. 2

Offset (byte)	Unit/ Res.	Range	Diag Bit (byte 8)	Size (byte)	Dual Comm	Description
0	-	-	7	1	D00	$B_{7,6}$ Pressure unit (0 = Torr, 1 = mBar, 2 = Pa, 3 = not allowed) $B_{5..0}$ Not used
1	-	-	6	1	WI0	B_2 Remote I/O interlock polarity (0=normal, 1=reversed) (writable only with HV off) B_1 Auto Power ON (0 = no, 1 = yes, writable only with HV off)
2	1bit= 1mA	10 to100	5	1	K01	HV1 I protect (writable in step of 10mA and only with HV off)
3	1bit= 1mA	10 to100	4	1	K02	HV2 I protect (writable in step of 10mA and only with HV off)
4	Pressure unit selected	1 to 99 -9 to -1	3	2	P01	HV1 SetPoint 1 Byte offset 4 =mantissa (only with HV off) Byte offset 5 = exponent (only with HV off) HV1-SetPoint-1 must be greater than HV1-SetPoint-2 See Note-1

Offset (byte)	Unit/ Res.	Range	Diag Bit (byte 8)	Size (byte)	Dual Comm	Description
6	Pressure unit selected	1 to 99 -9 to -1	2	2	Q01	HV1 Setpoint 2 (writable only with HV off) Byte offset 6 = mantissa (only with HV off) Byte offset 7 = exponent (only with HV off) HV1-SetPoint-1 must be greater than HV1-SetPoint-2 See Note-1
8	Pressure unit selected	1 to 99 -9 to -1	1	2	P02	HV2 Setpoint 1 (writable only with HV off) Byte offset 8 = mantissa (only with HV off) Byte offset 9 = exponent (only with HV off) HV2-SetPoint-1 must be greater than HV2-SetPoint-2 See Note-1
10	Pressure unit selected	1 to 99 -9 to -1	0	2	Q02	HV2 Setpoint 2 (writable only with HV off) Byte offset 10 = mantissa (only with HV off) Byte offset 11 = exponent (only with HV off) HV2-SetPoint-1 must be greater than HV2-SetPoint-2 See Note-1

NOTE Each set point value is divided into 2 bytes: one for mantissa (the value is divided by 10) and one for exponent with sign. So for example, if you want to set the HV1-Set-Point-1 to 3.5s-5 you have to write: byte offset 4 = 35d (23hex), byte offset 5 = -5d (FBhex)

NOTE This buffer is repeated for each Dual connected on the 485 bus, so the configuration buffer length is between 12 and 4x12=48 bytes. The diagnostic bytes are: offset 8 for first controller, offset 14 for 2nd controller, offset 20 for 3rd controller, offset 26 for 4th controller.

Output Buffer Structure (for each Controller Configured on the RS-485 Network)

Total buffer length: 1 bytes

Tab. 3

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
Dual with RS-485 address 1, always present					
0	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)
Dual with RS-485 address 2, present only if 2 Dual modules are configured on Dual Profibus Gateway					
1	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)
Dual with RS-485 address 3, present only if 3 Dual modules are configured on Dual Profibus Gateway					

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
2	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)
Dual with RS-485 address 4, present only if 4 Dual modules are configured on Dual Profibus Gateway					
3	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)

Input Buffer Structure (for each Controller Configured on the Network)

Total buffer length: 25 bytes (9 bytes + 8 word)

Tab. 4

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
Dual with RS-485 address 1, always present					
0	-	1		B7	RS485 communication status (0 = ok, 1 = not good)
				B6	Configuration status (0 = ok, 1 = not good, if not good please see diagnostic buffer)
				B5	
				B4	
				B3	
				B2	
				B0-B1	Device serial address (1 to 4)
1	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
2		1	]00	Interlock status This byte reports the status of all interlock signals (0 = interlock present, 1 = interlock missing) B_7 HV2 cable interlock B_6 HV2 remote I/O interlock B_5 Front panel interlock (equal to B1) B_4 Reserved (always 0) B_3 HV1 cable interlock B_2 HV1 remote I/O interlock B_1 Front panel interlock (equal to B5) B_0 Reserved (always 0)
3		1	g01	Remote I/O output HV1 This byte reports the status of all HV1 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 SetPoint 1 active (0=no, 1=yes) B_1 SetPoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)
4		1	g02	Remote I/O output HV2 This byte reports the status of all HV2 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 Setpoint 1 active (0=no, 1=yes) B_1 Setpoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
5		1	h01	Remote I/O input HV1 This byte reports the status of all HV1 input connector signals B_7 Remote I/O interlock (0 = present, 1 = missing) B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1
6		1	h02	Remote I/O input HV2 This byte reports the status of all HV2 input connector signals B_7 Remote I/O interlock B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1 always 1
7	1bit= 100V	1	S01	V meas HV1
8	1bit= 100V	1	S02	V meas HV2
9	A	4-float	T01	I meas HV1
13	A	4-float	T02	I meas HV2

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
17	Pressure unit selected	4-float	U01	Pressure HV1	
21	Pressure unit selected	4-float	U02	Pressure HV2	
Dual with RS-485 address 2, present only if 2 Dual modules are configured on Dual Profibus Gateway					
25	-	1		B_7	RS485 communication status (0 = ok, 1 = not good)
				B_6	Configuration status (0 = ok, 1 = not good, if not good please see diagnostic buffer)
				B_5	
				B_4	
				B_3	
				B_2	
				B_0-B_1	Device serial address (1 to 4)
26	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
27		1	]00	Interlock status This byte reports the status of all interlock signals (0 = interlock present, 1 = interlock missing) B_7 HV2 cable interlock B_6 HV2 remote I/O interlock B_5 Front panel interlock (equal to B_1) B_4 Reserved (always 0) B_3 HV1 cable interlock B_2 HV1 remote I/O interlock B_1 Front panel interlock (equal to B_5) B_0 Reserved (always 0)
28		1	g01	Remote I/O output HV1 This byte reports the status of all HV1 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 SetPoint 1 active (0=no, 1=yes) B_1 SetPoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)
29		1	g02	Remote I/O output HV2 This byte reports the status of all HV2 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 Setpoint 1 active (0=no, 1=yes) B_1 Setpoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
30		1	h01	Remote I/O input HV1 This byte reports the status of all HV1 input connector signals B_7 Remote I/O interlock (0 = present, 1 = missing) B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1
31		1	h02	Remote I/O input HV2 This byte reports the status of all HV2 input connector signals B_7 Remote I/O interlock B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1 always 1
32	1bit= 100V	1	S01	V meas HV1
33	1bit= 100V	1	S02	V meas HV2
34	A	4-float	T01	I meas HV1
38	A	4-float	T02	I meas HV2

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
42	Pressure unit selected	4-float	U01	Pressure HV1	
46	Pressure unit selected	4-float	U02	Pressure HV2	
Dual with RS-485 address 3, present only if 3 Dual modules are configured on Dual Profibus Gateway					
50	-	1		B_7	RS485 communication status (0 = ok, 1 = not good)
				B_6	Configuration status (0 = ok, 1 = not good, if not good please see diagnostic buffer)
				B_5	
				B_4	
				B_3	
				B_2	
				B_0-B_1	Device serial address (1 to 4)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
51	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 = not allowed)
52		1	]00	Interlock status This byte reports the status of all interlock signals (0 = interlock present, 1 = interlock missing)	
				B_7	HV2 cable interlock
				B_6	HV2 remote I/O interlock
				B_5	Front panel interlock (equal to B_1)
				B_4	Reserved (always 0)
				B_3	HV1 cable interlock
				B_2	HV1 remote I/O interlock
				B_1	Front panel interlock (equal to B_5)
				B_0	Reserved (always 0)
53		1	g01	Remote I/O output HV1 This byte reports the status of all HV1 output connector signals	
				B_7	Always 0
				B_6	Protect mode (0=no, 1=yes)
				B_5	Remote or Local (0) / Serial (1)
				B_4	HV fault (0=no, 1=yes)
				B_3	Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte)
				B_2	SetPoint 1 active (0=no, 1=yes)
				B_1	SetPoint 2 active (0=no, 1=yes)
				B_0	High voltage enable (0 = HV off, 1 = HV on)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
54		1	g02	Remote I/O output HV2 This byte reports the status of all HV2 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 Setpoint 1 active (0=no, 1=yes) B_1 Setpoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)
55		1	h01	Remote I/O input HV1 This byte reports the status of all HV1 input connector signals B_7 Remote I/O interlock (0 = present, 1 = missing) B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1
56		1	h02	Remote I/O input HV2 This byte reports the status of all HV2 input connector signals B_7 Remote I/O interlock B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1 always 1
57	1bit= 100V	1	S01	V meas HV1

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description	
58	1bit= 100V	1	S02	V meas HV2	
59	A	4-float	T01	I meas HV1	
63	A	4-float	T02	I meas HV2	
67	Pressure unit selected	4-float	U01	Pressure HV1	
71	Pressure unit selected	4-float	U02	Pressure HV2	
Dual with RS-485 address 4, present only if 4 Dual modules are configured on Dual Profibus Gateway					
75	-	1		B_7	RS485 communication status (0 = ok, 1 = not good)
				B_6	Configuration status (0 = ok, 1 = not good, if not good please see diagnostic buffer)
				B_5	
				B_4	
				B_3	
				B_2	
				B_0-B_1	Device serial address (1 to 4)
76	-	1	A01	B_7	HV1 on/off (0=off, 1=on)
			A02	B_6	HV2 on/off (0=off, 1=on)
			C01	B_5	HV1 protect mode on/off (0=off, 1=on)
			C02	B_4	HV2 protect mode on/off (0=off, 1=on)
			B01	B_3	HV1 mode (0=fixed, 1=step)
			B02	B_2	HV2 mode (0=fixed, 1=step)
			Z00	$B_{1,0}$ =	Local/Serial/Remote (0 = Local, 1 = Remote, 2 = Serial, 3 not allowed)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
77		1	]00	Interlock status This byte reports the status of all interlock signals (0 = interlock present, 1 = interlock missing) B_7 HV2 cable interlock B_6 HV2 remote I/O interlock B_5 Front panel interlock (equal to B_1) B_4 Reserved (always 0) B_3 HV1 cable interlock B_2 HV1 remote I/O interlock B_1 Front panel interlock (equal to B_5) B_0 Reserved (always 0)
78		1	g01	Remote I/O output HV1 This byte reports the status of all HV1 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 SetPoint 1 active (0=no, 1=yes) B_1 SetPoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)
79		1	g02	Remote I/O output HV2 This byte reports the status of all HV2 output connector signals B_7 Always 0 B_6 Protect mode (0=no, 1=yes) B_5 Remote or Local (0) / Serial (1) B_4 HV fault (0=no, 1=yes) B_3 Interlock active (0 = all interlocks present , 1 = one interlock missing, see “interlock status” byte) B_2 Setpoint 1 active (0=no, 1=yes) B_1 Setpoint 2 active (0=no, 1=yes) B_0 High voltage enable (0 = HV off, 1 = HV on)

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
80		1	h01	Remote I/O input HV1 This byte reports the status of all HV1 input connector signals B_7 Remote I/O interlock (0 = present, 1 = missing) B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1
81		1	h02	Remote I/O input HV2 This byte reports the status of all HV2 input connector signals B_7 Remote I/O interlock B_6 Confirm HV on B_5 HV Enable B_4 Protect Mode B_3 Remote Mode B_2 Step Mode (0 = no, 1 = yes) B_1 always 1 B_0 always 1

Offset (byte)	Unit/ Res.	Size (byte)	Dual Comm	Description
82	1bit= 100V	1	S01	V meas HV1
83	1bit= 100V	1	S02	V meas HV2
84	A	4-float	T01	I meas HV1
88	A	4-float	T02	I meas HV2
92	Pressure unit selected	4-float	U01	Pressure HV1
96	Pressure unit selected	4-float	U02	Pressure HV2

Diagnosis Management

In addition to the Profibus six byte standard diagnostic, the interface provides both user diagnostic and static diagnostics functions.

Standard diagnostic

The standard diagnostic management is fully compliant with the Profibus specification.

User diagnostic

The first byte in the user diagnostic area reflects the controller serial link status with following meaning:

Bit 0:	controller doesn't respond (RS485 link broken)
Bit 1:	controller not identified (not compatible with the Profibus Interface)
Bit 2:	first loop of requests not ended (values in the input data are not fully coherent yet)
Bit 4,5,6,7:	number of controller detected on the low speed (Rs485) line

So, if the low nibble in the first byte is equal to 0, the interface is working properly. Otherwise there is a problem.

During the start-up phase after one interface power on or controller power on, the first byte can assume values different from zero for few seconds.

Each nibble (4 bits) in the bytes following the interface status byte, represents the status of the last attempt to write a parameter with following coding **(diag status byte)**:

1. Write success
2. Protocol error (checksum error on low speed network)
3. Invalid channel
4. Invalid data
5. Invalid channel
6. Range error
7. Format error
8. Write not allowed while HV ON
9. Write not allowed while HV OFF
10. Write allowed only in serial mode

The Profibus external diagnosis services are used to report following unexpected situations:

Controller Fails

If the controller switches to fail mode, an external diagnostic service is required and one byte in the diagnostic buffer signals the type of failure.

User Parameter Mismatch

If the user sets one or more parameters out of their allowed range, a Profibus external diagnostic service is required and some bits in the diagnosis frame signals which parameter is wrong (i.e. over range or under range)

Diagnostic Buffer Structure

Tab. 5

Offset	Meaning		
0	B_0	station non exist (set by master)	Standard diagnostics
	B_1	station not ready (slave not ready for data exchange)	
	B_2	cfg fault (configuration data doesn't match)	
	B_3	ext diag (slave has external diagnostic data)	
	B_4	not supported (slave doesn't support requested function)	
	B_5	invalid slave response (slave sets permanent '0')	
	B_6	prm fault (wrong parameter assignment)	
	B_7	master_lock (slave is parameterised by another master)	
1	B_0	prm req (slave has to be re-parameterised)	
	B_1	stat diag (static diagnosis)	
	B_2	fixed '1'	
	B_3	wd_on (response monitoring active)	
	B_4	Freeze mode (received freeze command)	
	B_5	Synch mode (received synch command)	
	B_6	reserved	
	B_7	diag deactivated (slave is parameterised by another master)	
2	Reserved		
3	Master Add (master address after parameterisation. FF= without parameter)		
4	Ident number high		
5	Ident number low		
6	External diagnosis "Header" length indication including header		

Offset	Meaning		
7	Interface Status		External diagnostic Dual address 1
	B_0	Controller not responds	
	B_1	Controller not identified	
	B_2	Input data not fully coherent yet	
	B_3	Not used	
	$B_{4...7}$	Number of devices recognised on the low-speed network	
8	Parametrisation diagnostic byte 0		
9	Parametrisation diagnostic byte 1		
10	HV1 on/off diagnostic status byte (most significant nibble) HV2 on/off diagnostic status byte (most significant nibble)		
11	HV1 protect mode diagnostic status byte (most significant nibble) HV2 protect mode diagnostic status byte (less significant nibble)		
12	HV1 mode diagnostic status byte (most significant nibble) HV2 mode diagnostic status byte (less significant nibble)		
13	Local/serial/remote diagnostic status byte (most significant nibble)		

14	Parametrisation diagnostic byte 0		External diagnostic Dual adress 2
15	Parametrisation diagnostic byte 1		
16	HV1 on/off diagnostic status byte (most significant nibble) HV2 on/off diagnostic status byte (most significant nibble)		
17	HV1 protect mode diagnostic status byte (most significant nibble) HV2 protect mode diagnostic status byte (less significant nibble)		
18	HV1 mode diagnostic status byte (most significant nibble) HV2 mode diagnostic status byte (less significant nibble)		
19	Local/serial/remote diagnostic status byte (most significant nibble)		

Offset	Meaning	
20	Parametrisation diagnostic byte 0	External diagnostic Dual adress 3
21	Parametrisation diagnostic byte 1	
22	HV1 on/off diagnostic status byte (most significant nibble) HV2 on/off diagnostic status byte (most significant nibble)	
23	HV1 protect mode diagnostic status byte (most significant nibble) HV2 protect mode diagnostic status byte (less significant nibble)	
24	HV1 mode diagnostic status byte (most significant nibble) HV2 mode diagnostic status byte (less significant nibble)	
25	Local/serial/remote diagnostic status byte (most significant nibble)	

26	Parametrisation diagnostic byte 0	External diagnostic Dual adress 4
27	Parametrisation diagnostic byte 1	
28	HV1 on/off diagnostic status byte (most significant nibble) HV2 on/off diagnostic status byte (most significant nibble)	
29	HV1 protect mode diagnostic status byte (most significant nibble) HV2 protect mode diagnostic status byte (less significant nibble)	
30	HV1 mode diagnostic status byte (most significant nibble) HV2 mode diagnostic status byte (less significant nibble)	
31	Local/serial/remote diagnostic status byte (most significant nibble)	

Technical Specifications

Tab. 6

Operating ambient temperature	+5 °C to +40 °C / 0 – 90 % relative humidity
Storage ambient temperature	+0 °C to +70 °C / 0 – 95 % relative humidity
Power supply:	
Input voltage:	24V dc +/-10 %
Max input power:	8W
Protection fuse:	T-1A (slow blow)
Compliance with:	EN 55011 (Radio disturbance characteristics) EN 61000-6-2 and EN 61326 (Immunity for industrial environments) which recall: - EN 61000-4-2 (Electrostaticdischarge phenomena) - EN 61000-4-3 (Radiatedhigh-frequency phenomena) - EN 61000-4-4, EN 61000-4-5, EN61000-4-6 (Conducted high-frequency phenomena) - EN 61000-4-8 (low frequency magnetic field)
Installation Category	II
Pollution Degree	2
Environment protection	IP-20
Weight kg (lbs)	0.38 (0.83)

Agilent Technologies

Vacuum Products Division

Dear Customer,

Thank you for purchasing an Agilent vacuum product. At Agilent Vacuum Products Division we make every effort to ensure that you will be satisfied with the product and/or service you have purchased.

As part of our Continuous Improvement effort, we ask that you report to us any problem you may have had with the purchase or operation of our products. On the back side you find a Corrective Action request form that you may fill out in the first part and return to us.

This form is intended to supplement normal lines of communications and to resolve problems that existing systems are not addressing in an adequate or timely manner.

Upon receipt of your Corrective Action Request we will determine the Root Cause of the problem and take the necessary actions to eliminate it. You will be contacted by one of our employees who will review the problem with you and update you, with the second part of the same form, on our actions.

Your business is very important to us. Please, take the time and let us know how we can improve.

Sincerely.

Giampaolo LEVI

Vice President and General Manager
Agilent Vacuum Products Division

Note: Fax or mail the Customer Request for Action (see backside page) to Agilent Vacuum Products Division (Torino) – Quality Assurance or to your nearest Agilent representative for onward transmission to the same address.

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO: AGILENT VACUUM PRODUCTS DIVISION TORINO – QUALITY ASSURANCE

FAX N°: XXXX-011-9979350

ADDRESS: AGILENT TECHNOLOGIES ITALIA S.p.A. – Vacuum Products Division –

Via F.lli Varian, 54 – 10040 Leinì (TO) – Italy

E-MAIL: vpd-qualityassurance_pdl-ext@agilent.com

NAME	COMPANY	FUNCTION

ADDRESS:

TEL. N° : _____ FAX N° : _____

E-MAIL: _____

PROBLEM / SUGGESTION :

REFERENCE INFORMATION (model n°, serial n°, ordering information, time to failure after installation, etc.):

DATE _____

CORRECTIVE ACTION PLAN / ACTUATION (by AGILENT VPD) LOG N° _____

XXX = Code for dialing Italy from your country (es. 01139 from USA; 00139 from Japan, etc.)

Agilent Technologies

Agilent Technologies

Vacuum Products Division
Instructions for returning products

Dear Customer:

Please follow these instructions whenever one of our products needs to be returned.

1) Complete the attached Request for Return form and send it to Agilent Technologies (see below), taking particular care to identify all products that have pumped or been exposed to any toxic or hazardous materials.

2) After evaluating the information, Agilent Technologies will provide you with a Return Authorization (RA) number via email or fax, as requested.
Note: Depending on the type of return, a Purchase Order may be required at the time the Request for Return is submitted. We will quote any necessary services (evaluation, repair, special cleaning, eg).

3) **Important steps for the shipment of returning product:**
   - Remove all accessories from the core product (e.g. inlet screens, vent valves).
   - Prior to shipment, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
   - If ordering an Advance Exchange product, **please use the packaging from the Advance Exchange to return the defective product.**
   - Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
   - Agilent Technologies is not responsible for returning customer provided packaging or containers.
   - **Clearly label package with RA number.** Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a RA clearly written on the outside cannot be accepted and will be returned.

4) Return only products for which the RA was issued.

5) **Product being returned under a RA must be received within 15 business days.**

6) **Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information.** Customer is responsible for freight charges on returning product.

7) Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.

RETURN THE COMPLETED **REQUEST FOR RETURN** FORM TO YOUR NEAREST LOCATION:

EUROPE:	**NORTH AMERICA:**	**PACIFIC RIM:**
Fax: 00 39 011 9979 330		
Fax Free: 00 800 345 345 00	Fax: 1 781 860 9252	please visit our website for individual
Toll Free: 00 800 234 234 00	Toll Free: 800 882 7426, Option 3	office information
vpt-customercare@agilent.com	vpl-ra@agilent.com	http://www.agilent.com

Agilent Technologies

Vacuum Products Division
Request for Return Form
(Health and Safety Certification)

Please read important policy information on Page 3 that applies to all returns.

1) CUSTOMER INFORMATION

Company Name:	**Contact Name:**
Tel: **Email:**	**Fax:**
Customer Ship To:	**Customer Bill To:**
Europe only: **VAT reg. Number:**	USA/Canada only: ☐ **Taxable** ☐ **Non-taxable**

2) PRODUCT IDENTIFICATION

Product Description	Agilent P/N	Agilent S/N	Original Purchasing Reference

3) TYPE OF RETURN (**Choose one from each row** and supply Purchase Order if requesting a billable service)

3A. ☐ Non-Billable ☐ Billable ➡ New PO # (hard copy must be submitted with this form):

3B. ☐ Exchange ☐ Repair ☐ Upgrade ☐ Consignment/Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

4) HEALTH and SAFETY CERTIFICATION

AGILENT TECHNOLOGIES CANNOT ACCEPT ANY PRODUCTS CONTAMINATED WITH BIOLOGICAL OR EXPLOSIVE HAZARDS, RADIOACTIVE MATERIAL, OR MERCURY AT ITS FACILITY.
Call Agilent Technologies to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):

☐ **HAS NOT** pumped or been exposed to any toxic or hazardous materials. OR

☐ **HAS** pumped or been exposed to the following toxic or hazardous materials. If this box is checked, the following information must also be filled out. Check boxes for all materials to which product(s) pumped or was exposed:

☐ Toxic ☐ Corrosive ☐ Reactive ☐ Flammable ☐ Explosive ☐ Biological ☐ Radioactive

List all toxic/hazardous materials. Include product name, chemical name, and chemical symbol or formula:

_____

NOTE: If a product is received at Agilent which is contaminated with a toxic or hazardous material that was not disclosed, **the customer will be held responsible** for all costs incurred to ensure the safe handling of the product, and **is liable** for any harm or injury to Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Print Name: **Authorized Signature: .....** **Date:**

5) FAILURE INFORMATION:

Failure Mode (REQUIRED FIELD. See next page for suggestions of failure terms):
Detailed Description of Malfunction: (Please provide the error message)
Application (system and model):

I understand and agree to the terms of Section 6, Page 3/3.
Print Name: **Authorized Signature: .....** **Date:**

Agilent Technologies

Vacuum Products Division
Request for Return Form
(Health and Safety Certification)

Please use these Failure Mode to describe the concern about the product on Page 2.

TURBO PUMPS and TURBO CONTROLLERS

APPARENT DEFECT/MALFUNCTION		POSITION	PARAMETERS	
- Does not start	- Noise	- Vertical	Power:	Rotational Speed:
- Does not spin freely	- Vibrations	-Horizontal	Current:	Inlet Pressure:
- Does not reach full speed	-Leak	-Upside-down	Temp 1:	Foreline Pressure:
- Mechanical Contact	-Overtemperature	-Other:	Temp 2:	Purge flow:
- Cooling defective	-Clogging	.....	OPERATING TIME:	

ION PUMPS/CONTROLLERS

- Bad feedthrough	- Poor vacuum
- Vacuum leak	- High voltage problem
- Error code on display	- Other

VALVES/COMPONENTS

- Main seal leak	- Bellows leak
- Solenoid failure	- Damaged flange
- Damaged sealing area	-Other

LEAK DETECTORS

- Cannot calibrate	-No zero/high backround
- Vacuum system unstable	- Cannot reach test mode
- Failed to start	- Other

INSTRUMENTS

- Gauge tube not working	- Display problem
- Communication failure	- Degas not working
- Error code on display	- Other

SCROLL AND ROTARY VANE PUMPS

- Pump doesn't start	- Noisy pump (describe)
- Doesn't reach vacuum	- Over temperature
- Pump seized	- Other

DIFFUSION PUMPS

- Heater failure	- Electrical problem
- Doesn't reach vacuum	- Cooling coil damage
- Vacuum leak	- Other

Section 6) *ADDITIONAL TERMS*

Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.

- Customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies **within 15 business days**. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- A Special Cleaning fee will apply to all exposed products per Section 4 of this document.
- If requesting a calibration service, units must be functionally capable of being calibrated.

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